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THE CHARLES RIVER VALLEY:

A Guide For Citizens Concerned About Its Future

Charles River Valley Group
League of Women Voters

The Charles River Valley Group of the League of Women Voters gratefully acknowledges the financial contribution of Metcalf & Eddy, Inc., of Boston toward the printing of this booklet. The responsibility for the contents, however, is of course solely that of the League.

Copies available by sending 40 cents (to cover cost of mailing and handling) to:

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PREFACE

Management of the Charles River and adjacent land requires careful consideration in order to protect its varied uses and to fulfill the need for clean running water. Issues concerning the river's banks, water pollution, dumping, recreation, housing and urban development, industrial uses, water flow, and conservation are all interrelated. The aim of this booklet is to present some background and information to help those who wish to preserve or to improve the condition of the Charles River Valley.

The League of Women Voters recognizes the need to know facts in order to accomplish political change. The information presented here enabled the Charles River Valley Group of the League of Women Voters to study, arrive at a consensus, and then to take action in the area of water resources. The Leagues represented are:

Belmont
Boston
Brookline
Cambridge
Dedham
Dover
Lincoln
Medfield
Natick
Needham
Newton
Norfolk County West
Sherborn
Waltham
Watertown
Wellesley
Weston
Westwood

Our conclusions, embodied in statements made before the Corps of Engineers and the Water Quality Hearings, are at the end of the booklet. "Conclusions" is perhaps the wrong word because we are still studying, still gleaning

facts, still walking the river's banks, and still observing the watershed. We are continuing to hold meetings - in short, continuing to learn.

It would be impossible to thank by name the many people who have helped us. We have worked with people at all levels of Government who show both knowledge and concern - and a willingness to share them. We have worked with people in journalism, academic institutions, and in private organizations who have been helpful. All are fine examples of "the new conservationist" who is conscious of the many uses of a river.

June 1968

DESCRIPTION OF THE CHARLES RIVER

The Charles is a river of great historic importance. It also has a great future, especially as a source of recreation and environmental beauty to an urban and semi-urban people. Here are some facts about the Charles:

Geologically it is an "old river" and therefore slow flowing and meandering. The river's source is man-made Echo Lake in Hopkinton and the streams flowing into it; its mouth is Boston Harbor. The watershed drops in altitude only 560 feet from source to mouth. It is 31 miles long as the crow flies, and the river runs for 78.94 river miles. The watershed drains an area of 307 square miles.

Politically the Charles River watershed contains 5 cities and 30 towns (5 of which barely touch the borders of the watershed) and is represented in 4 counties and 7 congressional districts. Its population is 856,000 and growing. It serves well over 1,000,000 when commuters and recreation seekers are included. About 2/3 of the watershed is in the Boston Metropolitan Statistical District (all except 5 towns of the upper watershed).

The Charles River is characterized by many man-made changes: 21 dams, none of which provides power any longer; 93 bridges; at least 4 canals; many mill ponds and reservoirs. Among its most interesting man-made features are The Mother Brook and The Lower Basin. The former, built in

---

The following cities and towns are in the Charles watershed (those barely touching the borders are marked with an asterisk*): Arlington*, Ashland*, Bellingham, Belmont, Boston, Brookline, Cambridge, Dedham, Dover, Foxboro*, Franklin, Holliston, Hopedale, Hopkinton, Lexington, Lincoln, Medfield, Medway, Mendon*, Milford, Millis, Natick, Needham, Newton, Norfolk, Sherborn, Somerville, Walpole, Waltham, Watertown, Wayland*, Wellesley, Weston, Westwood and Wrentham.

1640, is a canal and brook in Dedham which connects the Charles with the Neponset River. Originally built to provide power for mills, the brook still diverts 1/3 of the Charles River flow to the Neponset. The Basin, created by the building of a dam in 1910, changed the tidal estuary of the Charles into a lake of nearly constant level.

HISTORY OF THE CHARLES RIVER

Early Settlers

Indians used the Charles River as a center of their lives. Discovery of fishing weirs and of artifacts from "pre-history" indicate that Indian civilization existed along its banks before 3,000 B.C.. The Indian name for the Charles River was "Quinobequin", meaning "winding".

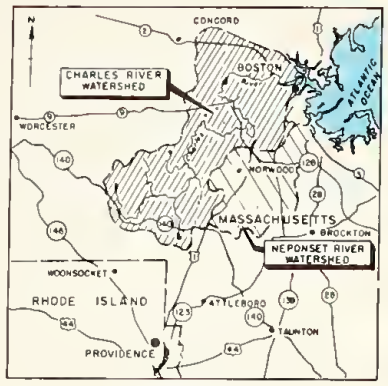
There is no hard evidence that Norsemen explored the river. The first recorded exploration was by Champlain in 1604. He named it "Riviere du Guast", and he assumed that it was one of the great rivers of the continent although he did not venture far beyond the estuary. Captain John Smith explored the river in 1614 and made the same assumptions as Champlain without even having gone up to the rapids at Watertown. He wrote: "The river doth pierce many days' journeys the intrails of that country". He named it Charles River in honor of the English prince.

The first settler was Rev. William Blackstone, who built his house on Shawmut Peninsula (now Boston) in 1625 and enjoyed a solitary life and pleasant relations with the Indians. After the settlement of the Puritans in Boston in 1630, Blackstone left and settled in the valley which bears his name.

Thereafter the Charles River was the means by which men explored and settled the inland. Sir Richard Saltonstall founded Newtowne (Cambridge) in 1630; others went to Watertown and to Dedham. In 1660 Rev. John Eliot built his mission to the Algonquin Indians at South Natick. And when Sir Charles Frankland built his mansion in Hopkinton in 1741 it could be said that the Charles watershed was inhabited from source to mouth.

MERRIMACK RIVER BASIN (SHAWSHEEN)

MYSTIC RIVER BASIN



VICINITY MAP

SCALE IN MILES

10 0 10

LOCATION MAP

SCALE IN MILES

25 0 25 50 75 100

LINCOLN
LEXINGTON
ARLINGTON
BELMONT
SOMERVILLE
CHARLESTOWN
CAMBRIDGE
BOSTON
WALTHAM
WATERTOWN
NEWTON
BROOKLINE
WESTON
WAYLAND
WELLESLEY
NEEDHAM
DEDHAM
WEST ROXBURY
DEDHAM ISLAND
NATICK
FRAMINGHAM
DOVER
SHERBORN
WESTWOOD
ASHLAND
MEDFIELD
HOPKINTON
HOLLISTON
MILLIS
MEDWAY
WALPOLE
MILFORD
NORFOLK
FRANKLIN
FOXBORO
BELLINGHAM
WRENTHAM
HOPEDALE
MENDON

MOODY ST. DAM
WATERTOWN DAM
CHARLES R. DAM
ROLLING STONE (BEMIS) DAM
BLEACHERY DAM
NEWTON LOWER FALLS DAM
CORDINGLEY DAM
METROPOLITAN CIRCULAR DAM
SILK MILL DAM
MOTHER BROOK CONTROL STRUCT.
COCHRANE DAM (CHARLES R. VILLAGE)
SO. NATICK DAM
ECHO LAKE DAM
WATERWORKS DAM
DILLA ST. DAM
CEDAR SWAMP POND DAM
WEST MEDWAY DAM
MEDWAY DAM
CARYVILLE DAM
NO. BELLINGHAM DAM
BOX POND DAM

CHARLES RIVER BASIN

MERRIMACK RIVER (SUDBURY-CONCORD)

NEPONSET RIVER BASIN

BLACKSTONE RIVER BASIN

TAUNTON RIVER BASIN

US 495

LEGEND

EXISTING DAMS

LOWER CHARLES INTERIM REPORT STUDY AREA

CHARLES RIVER WATERSHED

CHARLES RIVER, MASSACHUSETTS

SCALE IN MILES

JANUARY 1967

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

PLATE NO. 1

Industry

Originally a wilderness stream and then used by agriculture, the Charles also served industry. The Mother Brook powered a grist mill in Dedham. Mr. Francis Lowell began his cotton textile mill empire at Moody Street Dam in Waltham in 1813. Many communities on the river became famous for their industry (Waltham); others were named for their industrial functions (Millis, Milford).

Bridges and Ferries

From the beginning, settlements had sprung up in Charlestown and Cambridge. The first ferry went between Charlestown and the North End, a perquisite of Harvard College, which charged one penny, a fee which was halved on lecture days. The first bridge across the Charles was the North Harvard Street bridge, built in 1662 at the site of the present Anderson Bridge in Cambridge. By and large, however, the river itself provided the means of transportation and a second bridge was not built until 1786 when John Hancock and others built a particularly elegant one rather near the Harvard Ferry despite Harvard's vociferous objections.

Fill Operations in the Estuary

In modern times we view filling of river banks with concern, but the lower Charles River was altered many times. The changes began in 1799 when Charles Street in Boston was formed from Mt. Vernon land dumped into the river. The filling of "the Back Bay" in the 1850's is, of course, well known. The building of the Charles River Dam and the formation of the present Lower Basin has already been mentioned.

Acquisition of Parklands

Owing to the guidance of Frederick Law Olmsted and the foresight of citizens

such as Charles Eliot, Metropolitan Boston developed the first park system in the country in 1893, much of which centered around the Charles River and its tributaries. The Muddy River parkland and its roads were virtually the first applications of the concept of "parkways". Since then much land in the Charles watershed has been preserved as public open space. As a result, of the 106 miles of river bank within the Metropolitan District, 39 miles are publicly owned.

The Future

Proposals are constantly being made affecting the Charles River's future. The Corps of Engineers is evolving a plan for low-flow augmentation, flood control, and other matters (see page 41). The Boston Redevelopment Authority, The Metropolitan District Commission, and the Metropolitan Area Planning Council all have produced plans affecting the river, its tributaries and their banks.

A new $21,200,000 dam is proposed at Warren Street, downstream from the present dam which forms the Charles River Basin. To be built with state and federal funds, it would be maintained by the MDC and include six flood control pumps which could discharge 5,400 million gallons of water per day into the harbor, if necessary. Three boat locks would handle river traffic and a highway would be built on the dam's top.

So the history of the river continues. A new look is clearly in its future.

GOVERNMENT AGENCIES AND COMMISSIONS

Local Agencies

1. CONSERVATION COMMISSION. Authorization: CH. 40, Sec. 8c; 3 to 7 members, appointed to 3-year terms. 270 such commissions in Massachusetts.

   Function: Development of natural resources in community, research, indexing of open spaces; coordinating activities of official and private groups; education; acquiring land; administering funds.

   Finances: Can accumulate fund (CH. 234, Acts of 1964). Can share in Self-Help program of Department of Natural Resources, receiving funds for land acquisition (possible to get 75% of cost, with Federal Bureau of Outdoor Recreation contributing 50% and State Self-Help money contributing 50% of remainder).

   Relation to Charles River: A commission in each community on the Charles except Boston and Waltham.

2. HEALTH, BOARD OF. Function: Enforces Sanitary Code, including matters of pollution. State Department of Public Health may enforce if local board fails. Control over sub-surface disposal systems of less than 2,000 gallons per day. Shares jurisdiction with local water department over sub-surface disposal systems on watersheds of reservoirs.

3. PLANNING BOARD. Function: Control of sub-divisions, planning functions, zoning functions.

   Relation to Charles River: Several communities in watershed have flood plain zoning or conservancy districts.

   Boston Redevelopment Authority has two projects directly related to the river. 1) Study of the Lower Charles and the Muddy Brook in relation to recreation and open space (Roy Mann, Planner).

2) Beautification and recreation development of 48 acres of Mill Pond and Mother Brook (John Slayton, Project Engineer).

4. SEWER DEPARTMENT. Function: Regulates disposal of sewage and sometimes solid waste.

   Relation to Charles River: See chapter on "Facilities" for list of sewer treatment plants and Metropolitan District Commission sewer system.

5. WATER DEPARTMENT. Function: Supervises water supply and distribution. Shares jurisdiction with Board of Health over sub-surface disposal systems in watershed of reservoirs.

   Relation to Charles River: Milford, Hopedale, Mendon and Cambridge regularly use surface water for water supply; others use sub-surface wells; 12 use the Metropolitan District Commission water supply.

County Agencies

1. CONSERVATION DISTRICT. Authorization: CH. 664, Sec. 24.

   Function: To conserve and improve soil, water and plant resources by proper land use; to conduct surveys; carry out control measures; cooperate with agencies or land occupiers; construct and maintain structures. Sponsors projects on small watersheds under PL566, Watershed Protection and Flood Prevention Act (which see). Helps to initiate work with Technical Teams (which see).

   Supervision By: 1) State Committee for Conservation of Soil, Water and Related Resources. 10-member policy-making board,

   2) Department of Natural Resources administers,

   3) 5-man unpaid board in each district. Elected by land occupiers of district.

Finances: State and county funds and funds from sale of Government surplus property. No federal funds.

Addresses: Norfolk: Norfolk County Agricultural School, 400 Main Street, Walpole; Middlesex: Massachusetts Avenue, Acton; Worcester (new office to be built): Holden.

Relation to Charles River: General work in area; No. PL566 project applications.

2. COUNTY EXTENSION SERVICE. Function: Work with commercial agriculture; some with home owners and community agencies; education and referral.

Organization: Board of Trustees for each county appointed by County Commissioners.

Finances: State funds, allocated by County Commissioners. Some federal funds through State Extension Service (which see).

Addresses: Middlesex-Essex-Worcester: 19 Everett Street, Concord; Norfolk-Plymouth-Bristol-Barnstable: 400 Main Street, Walpole, Joseph W. O'Donnell, Regional Resources Development Agent; Peter Larson, Floriculturist.

3. SOIL CONSERVATION WORK UNIT. Function: Local Arm of U.S. Soil Conservation Service (which see).

Addresses: Middlesex and Norfolk Counties: Massachusetts Avenue, Acton; Worcester: (new office to be built) Holden.

Metropolitan and State Agencies

1. COMMERCE AND DEVELOPMENT DEPARTMENT, DIVISION OF PLANNING. 150 Causeway Street, Boston, Frederick A. Fallon, Division Director.

Function: To form state and regional plans; to assist local planning with zoning and sub-division control; to assist administration of 701 federal funds providing grants to localities making master plans.

2. CONSERVATION OF SOIL, WATER AND RELATED RESOURCES (STATE COMMITTEE FOR THE). Authorization: CH. 664 of General Laws.
Function: Policy-making board, giving guidance to Department of Natural Resources in administration of 15 Conservation Districts (see County Listing).
Finances: Makes allotment of about $40,000 of state funds.

3. EDUCATION, DEPARTMENT OF. 182 Tremont Street, Boston, Senior Supervisor of Conservation Education, Raymond H. Gehling. 9-man Advisory Committee on Conservation Education.
Authorization: CH. 436 of Acts of 1961.
Function: To encourage and develop education in conservation field.
Relation to Charles River: Four pamphlets, "Outlook on Water", published with accompanying teacher guide (one of which deals with Charles River). Coordinated conservation program in Charles area, using funds of Title II, Elementary and Secondary Education Act. Tec Group, Brooke School, Weston.

4. EXTENSION SERVICE, MASSACHUSETTS. University of Massachusetts, Amherst, Mass. Dr. Arless A. Spielman, Director.
Function: Administers federal funds which pay part of salary, travel and other service of County Extension Service (which see). Under Federal Extension Service of Department of Agriculture.

5. FISHERIES AND GAME, DIVISION OF. James M. Shepard, Director, 100 Cambridge Street, Boston. Division Field Headquarters, Westboro.
Authorization: CH. 21, Sec. 7 of General Laws.
Function: An autonomous state agency administered by 5-man Fish and Game Board, appointed by Governor. Concern for all inland fish and wildlife. Oversees pollution control of some inland waters to protect fish and wildlife; administers federally-aided wildlife areas;

maintains hatcheries; stocks streams and ponds; issues licenses.

Finances: Receives 1/5 of 1% of gasoline tax, fees from licenses and fines, some federal aid for fish restoration projects.

Relation to Charles River: No designated wildlife areas; no control of fish ladders. Stocked the following waters in valley: Charles (at Natick), Stony, Cherry and Hobbs Brooks (Weston), Trout Brook (Dover), Dix, Miscoe and Shepards Brooks (Franklin), Vine, Mine and Hopping Brooks (Medway), Charles (Millis), Mill Brook and Charles (Norfolk), Jamaica Pond (Boston), Mill Brook (Milford), Stall Brook (Bellingham).

6. HISTORICAL COMMISSION. State House, Boston, Dr. Richard Hale, Archivist.

Authorization: CH. 695, Acts of 1963.

Function: Designates areas of historical sites and can hold property if given.

Relation to Charles River: No historic sites at present. Assisting with Corps of Engineers study (which see).

7. METROPOLITAN AREA PLANNING COUNCIL. 44 School Street, Boston, Mr. Franklin N. Flaschner, President; Robert G. Davidson, Director; Julia Broderick O'Brien, Chief Planner.

Authorization: CH. 668, Laws of 1963.

Function: An advisory and coordinating agency for planning among communities of metropolitan Boston. Now 92 cities and towns. Council representative appointed by each local Government. Staff of 35.

Finances: $117,000 assessed to communities on cherry sheet (not more than 5 cents per capita); federal 701 funds for studies (HUD); also federal transportation funds. Some state and MDC funds.

Relation to Charles River: MAPC is member of Coordinating Committee of Corps of Engineers Study. MAPC studies of special application are:

"Open Space and Recreational Plan and Program for Metropolitan Boston": Vol.II, Boston Harbor; Vol.III, Mystic-Charles-Neponset Rivers; Vol. I , Summary (in process); Vol. IV, Open Space and Conservation Law (in process).

"Comprehensive Land Use Inventory Report"

"Solid Waste Disposal Program for Metropolitan Boston": Vol. I; Vol. II and Vol. III (in process).

"Inventory of Water and Sewer Facilities".

"Economic Base and Population Study", Vol. I, Historical Analysis; Vol. II, Prospects for Growth; Vol. III, Population Projections.

8. METROPOLITAN DISTRICT COMMISSION. 20 Somerset Street, Boston, Howard T. Whitmore, Jr., Chairman. 5-man commission appointed by Governor.

Function: Holds and maintains 80.5% of the land along both banks of Charles in lower valley; water, sewer and park service. A state administrative agency with legislature appropriating funds for specific projects. Serves 52 cities and towns.

Finances: State funds for services, repaid by assessments on cities and towns; State Highways Fund pays some police and highway expenses; bond issues for some construction projects; special legislative actsffor most projects.

Division or Sections:

Sewerage: Adam E. Sulesky. Construction, operation and

maintenance of sewage disposal facilities (see page 49).

Construction: Martin Cosgrove, Acting Director. Construction of some pollution control and flood control facilities.

Recreation: James J. Whalen. Jurisdiction over rinks, pools, beaches, golf courses, fields, etc.

Park and Engineering: Benjamin W. Fink. Design and construction of facilities; some large maintenance, bridges, locks, draws.

Water: Charles O. Clark, Acting Director. Operation and maintenance of water supply facilities (Quabbin Lake; 240 miles of water mains; distribution reservoirs).

Police: William J. McCarthy. Protection of MDC property; maintenance; policing of Lower Basin.

Right of Way Section: John Grigalus. Negotiates settlements with property owners.

Locks and Drawbridge Section: Thomas J. Mooney.

Relation to Charles River: Most important agency in lower valley from point of view of land control, service, maintenance and supervision. Member of the Coordinating Committee of the Corps of Engineers Study. CH. 768, Acts of 1955 provides MDC dredges and improves Charles River, tributaries, Mother Brook and Long Ditch - in area between Watertown Dam and South Natick Dam.

9. NATURAL RESOURCES, DEPARTMENT OF. 100 Cambridge Street, Boston. Robert L. Yasi, Commissioner. 5-man Board of Natural Resources appointed by Governor.

Function: In overall charge of state natural resources. Active liaison with other state, federal and local agencies.

Divisions:

Acquisition-Construction: Richard Correia, Chief. $12,000,000 is shared with Fisheries and Game. Work outside MDC area.

Conservation Services: Arthur Brownell, Director. Administers State Self-Help land acquisition program ($1,000,000); administers Conservation Districts; supervision of Hatch Act and Coastal Wetlands Act; liaison with local Conservation Commissions; liaison with Bureau of Outdoor Recreation in its $5,000,000 grants from the Land and Water Conservation Fund of federal Government; liaison with Public Access Board; liaison with Resources Review Board which administers laws relating to alteration of coastal and inland wetlands.

Forests and Parks: Bruce S. Gullion, Director. Recreation, forests, pest control, fire control. Liaison with Bureau of Outdoor Recreation to implement Master Recreation Plan of State.

Law Enforcement: Kenneth A. Grossman, Director.

Marine Fisheries: Frederick C. Wilbour, Jr., Director. Concern with effect of pollution on marine biology; concern with fish ladders in river.

Open Lands Committee: Three directors; Acts on acquisition within the Department.

Water Pollution Control: Thomas C. McMahon, Director. Will have five sections (construction, operations and maintenance, planning and research, enforcement, engineering); will have personnel in 3 - 6 districts

throughout state; sets and enforces water quality standards; liaison with Federal Water Pollution Control Administration (which see). Powers under Clean Waters Act of the state (which see).

Water Resources: Charles Kennedy, Acting Director. Concern with water resources in state. See Water Resources Commission.

Relation to Charles River: Most important agency in the middle and upper valley. Member of Coordinating Committee of Corps of Engineers Study.

10. PUBLIC ACCESS BOARD. 100 Cambridge Street, Boston. Robert L. Yasi, Chairman. 4-member board consisting of Commissioner of Department of Public Works, Director of Fisheries and Game, Commissioner of MDC, Director of Division of Motor Boats.

Function: To acquire, construct and maintain access to public waters and related facilities.

Finances: 2/5 of 1% of gasoline tax (about $450,000 annually) available for legislative appropriation.

Relation to Charles: Constructed access at MDC rink in Brighton.

11. PUBLIC HEALTH, DEPARTMENT OF. Division of Sanitary Engineering, Water Pollution Control Section. State House, Boston.
John Collins, Director.

Authorization: CH. 111, Sec. 5 of General Laws.

Function: Under direction of 6-member Public Health Council, appointed by Governor. Advice to Government, industry and individuals on sub-surface waste treatment; review of sites for sewage and waste treatment plants; power to regulate and control disposition of sub-surface waste; oversees local Public Health Boards

in enforcement of State Sanitary Code; education program; bacteriological analysis of bathing areas and public water supply.

Relation to Charles River: Tests river and tributaries in relation to water supply as needed.

12. RECLAMATION BOARD, STATE. Department of Agriculture, 100 Cambridge Street, Boston. Edward Wright, Chairman.

Function: Principal concern is mosquito control and drainage of standing waters.

Financing: Norfolk Project (Bellingham through Dedham) financed by state appropriation, assessed back to towns; Middlesex Project (Newton through Cambridge) by local appropriation set by Board.

Relation to Charles: Some overseeing of clearance of obstacles from river; two special project areas in Norfolk and Middlesex Counties.

13. TECHNICAL TEAMS. Department of Natural Resources, 100 Cambridge Street, Boston. Arthur Brownell, Chairman, State Technical Team.

Function: Inter-agency approach to local resource planning and development by preparing inventories and evaluation of natural resource potentials. Application by locality through Conservation District chairman. Team includes members of: County Extension Services, Conservation Districts, Department of Commerce, Natural Resources, Division of Conservation Services, Forests and Parks, Law Enforcement, Marine Fisheries, State Extension Service, Water Resources Commission, Fisheries and Game, University of Massachusetts, U.S. Soil Conservation Service.

14. UNIVERSITY OF MASSACHUSETTS. Amherst, Massachusetts.

Function: Cooperated with U.S. Department of Agriculture in servicing County Extension Services with guidance and in-service

training; Dean of Agriculture is Director of Massachusetts Extension Service; University houses Water Resources Research Center (which see).

15. WATER RESOURCES COMMISSION, MASSACHUSETTS. 100 Cambridge Street, Boston,

Authorization: CH. 620, Laws of 1956.

Function: Coordinates all programs of water resource development; fact-finding; advisory to legislature and executive on water resources matters. Supervisory authority over PL566 projects (Watershed Protection and Flood Prevention Act, which see).

Relation to Charles River: Cooperates with MAPC studies. Maintains seven gauge stations on the Charles.

16. WATERWAYS, DIVISION OF. Department of Public Works, 100 Nashua Street, Boston. John T. Hannon, Deputy Chief Engineer.

Authorization: CH. 91 of General Laws.

Function: Some stream clearance and flood control.

Financing: Half state funds, half local funds. Localities must propose projects.

Relation to Charles River: Does stream clearance and flood work in upper Charles (MDC handles Lower Charles); most recent job: $275,000 project in Milford to excavate channel, build spillway, sewer siphons, reconstruct concrete box culvert.

Interstate Agencies

1. NEW ENGLAND REGIONAL COMMISSION. U.S. Post Office and Court House Building, Boston. Robert Gidez, Director; John J. Linnehan and Governor John A. Volpe, Co-chairman.

Authorization: Title V, Public Works and Economic Development Act of 1965.

Function: Members are the six New England governors. To initiate and coordinate overall economic development for New England. Concerns include water pollution. Works closely with New England River Basins Commission (which see).

2. NEW ENGLAND RIVER BASINS COMMISSION. U.S. Post Office and Court House Building, Boston. Frank Gregg, Chairman; Austin H. Wilkins, Vice Chairman; Malcolm E. Graf, Staff Director.

Authorization: Water Resources Planning Act of 1965.

Function: Organized September 6, 1967. An advisory body and clearing house with no enforcement function. It is principal agency for coordination of federal, interstate, local and non-governmental plans for the development of water and related land resources in its area. Works closely with New England Regional Commission (which see).

Financing: Half federal and half state. Each New England state contributes $35,000.

3. NEW ENGLAND INTERSTATE WATER POLLUTION CONTROL COMMISSION. 73 Tremont Street, Boston. Alfred A. Pelaquin, Executive Secretary.

Authorization: New England Interstate Water Pollution Control Compact, authorized by Congress in 1947.

Function: Compact has seven signatory states (New England plus New York); research projects; classification of streams; encouragement of treatment programs; close liaison with New England River Basins Commission. Sponsored 27 projects, about half of which resulted in publication. (Latest publication is "Water Law:

Stream Flow Rights"). Runs training course for sewage treatment plant operators using local and Manpower Retraining Program Funds.

Finances: Both federal and state funds. $65,000 annual budget.

Federal Agencies

1. AGRICULTURAL STABILIZATION AND CONSERVATION SERVICE. Department of Agriculture. State office: 28 Cottage Street, Amherst.

   Authorization: Soil Conservation and Domestic Allotment Act of 1936.

   Function: Services given direct or through county offices. Agricultural Conservation Program; cost-sharing assistance to individual farmers and woodland owners in program of soil, water, woodland and wildlife conservation.

   Finances: 50% from federal.

   Relation to Charles River: Many cost-sharing projects on banks of river dealing with dairy farms and woodlots.

2. AGRICULTURE, DEPARTMENT OF. Washington, D.C.

   Refer to: State Agricultural Experiment Stations (research)
   County Extension Service (education)
   Soil Conservation Service (technical assistance)
   PL566 Funds (loans)
   Agricultural Stabilization and Conservation Service (cost-sharing)

   Relation to Charles River: Member of Coordinating Committee of Corps of Engineers Study.

3. COAST AND GEODETIC SURVEY. Department of Commerce, 1000 Custom House, Boston.

   Function: Assistance to surveys; maps.

4. ENGINEERS, U.S. ARMY CORPS OF. 424 Trapelo Road, Waltham.

   Col. Remi O. Renier, Division Engineer, Northeast Division;

John W. Leslie, Chief of Engineering Division; Edward L. Hill, Chief of Planning Branch; Joseph L. Ignazio, Chief of Basin Planning; John M. Lind, Project Engineer.

Function: General authority over flood control and flood plain studies; studies.

Relation to Charles River: Corps is Government agency in charge of 5-year study of the river. Separate chapter has been devoted to this study (see page 41). Corps also conducted study evaluating potential flooding in town of Medway. Flood plain information report issued in August of 1967. Study authorized by 1965 federal enactment under Flood Control Act of 1960 (which see). No other valley town has applied.

5. FISH AND WILDLIFE SERVICE. Bureau of Sport Fisheries and Wildlife, Department of Interior, 801 Post Office Building, Boston.

Function: Manages fish and wildlife resources; operates refuges; administers aid to state fish and wildlife projects.

Finances: State must pass enabling legislation. Funds from waterfowl stamps.

Relation to Charles River: No refuges in valley. Matter once studied in connection with Medfield marshes, but Service did not recommend involvement. Service is participant in Corps of Engineers Study.

6. GEOLOGICAL SURVEY, U.S. Department of Interior, JFK Federal Building, Boston. Richard G. Petersen, District Geologist.

Function: Research and classification of ground and surface water; seismic data. Works with Corps of Engineers and Weather Bureau to measure rivers.

Relation to Charles River: Maintains gauging stations at:

Charles River Village below Cochrane Dam; Hemlock Gorge, Wellesley; Moody Street Dam, Waltham. Participant in Corps of Engineers Study. During floods of March 1968, took 450 color aerial views of Charles, to be available as an atlas.

7. HOUSING AND URBAN DEVELOPMENT, U.S. DEPARTMENT OF. Post Office and Courthouse Building, Boston. Donald Levitan, Special Assistant to Regional Administrator; Benjamin Robinson, Community Facilities Administration.

   Function: Administers planning funds with Division of Planning; advances for public works planning; grants for basic sewer and water facilities; public facility loans; grants for open space land and for historic preservation.

   Relation to Charles River: Helped finance Metropolitan Area Planning Council Studies; member of the Coordinating Committee of the Corps of Engineers; Public Works Advance Planning interest-free loans to the following: Bellingham for water study, Boston for sewer and water studies, Franklin for preliminary water plans, Medway for water system study; Westwood for sewer improvements. Water and Sewer Facilities Improvement Grants to Brookline for water distribution system and for separate sewer system.

8. OUTDOOR RECREATION, BUREAU OF. Department of Interior. No local office but coordinator is Thomas Lynch, Conservation Services Division, Department of Natural Resources.

   Function: Promotes and coordinates U.S. outdoor recreation activities. Administers Land and Water Conservation Fund Act, funds of which may be used by any Government agency, but review is by Department of Natural Resources. Must be part of updated master plan. CH. 707 of Acts of 1967 set up revolving fund to make

federal funds available for land acquisition at local level. (See Self-Help Program, Department of Natural Resources.)

Relation to the Charles River: Participant in the Corps of Engineers Study.

9. PUBLIC HEALTH SERVICE. Department of Health, Education, Welfare. JFK Federal Building, Boston.

Function: Deals with public water supply and with health aspects of water quality. Three programs to do with rivers are: 1) Solid Waste Program; 2) Water Supply and Sea Resources Program; 3) Environmental Sanitation Program.

Relation to Charles River: Member of Coordinating Committee of Corps of Engineers Study.

10. SOIL CONSERVATION SERVICE. 29 Cottage Street, Amherst, Benjamin Isgur, State Conservationist, Department of Agriculture.

Function: Gives technical assistance to individuals through Soil Conservation Act and groups with watershed programs through Watershed Protection and Flood Prevention Act. Works with Conservation Districts, with Technical Teams and with Agricultural Stabilization (which see). Local agency is Soil Conservation Work Unit (see County Agencies).

Relation to Charles River: Member of the Coordinating Committee of the Corps of Engineers Study.

11. WATER POLLUTION CONTROL ADMINISTRATION, FEDERAL. Department of Interior. JFK Federal Building, Boston, Lester M. Klashman, Regional Director. Northeast Water Quality Management Center, 240 Highland Avenue, Needham Heights. Walter M. Newman, Chief of New England River Basins Comprehensive Water Pollution Control Program.

Authorization: Federal Water Pollution Control Act as amended.

Function: Coordinate and administer federal pollution control

programs including construction grants, enforcement, research and planning. Maintain permanent laboratory to be built in Jamaica Plain (authorized in 1963).

Relation to Charles River: Develop program of low flow augmentation for water quality control. Also develop a water quality management action program in cooperation with the MDC and Massachusetts Division of Water Pollution Control. This is part of its overall New England River Basins Comprehensive Water Pollution Control Program (see special chapter on this subject).

12. WATER RESOURCES RESEARCH, OFFICE OF. Department of the Interior. State Center at University of Massachusetts, Amherst, Mass. Professor Bernard B. Berger, Director.

Authorization: Title II, Water Resources Research Act of 1964.

Function: Program of grants or matching funds to institutions, agencies, firms or individuals for research. (See University of Massachusetts listing)

13. WEATHER BUREAU. Department of Commerce, Environmental Science Services Administration, 1000 Custom House, Boston.

Function: Keeps climate records and forecasts weather. River forecasting done at River Forecast Center, Bradley Field, Windsor Locks, Connecticut.

Relation to Charles River: Participant in Corps of Engineers Study.

SOME RELEVANT LAWS, PROGRAMS AND STUDIES

Local Laws and Regulations

1. Zoning by-laws, especially Flood Plain Zoning and Conservancy Districts. Communities having conservancy district zoning (such as Dover) leave land open for agriculture, water supply or conservation and recreation. Communities having flood plain zoning (such as Needham) restrict building on the flood plain where flooding is likely to occur.

2. Board of Health enforces State Sanitary Code locally. Minimum requirements for disposal of sanitary sewage in unsewered areas.

State Laws and Regulations - Pollution Control

1. Sanitary Code (Article 11 applies to local control of disposal of sanitary sewage in unsewered areas) adopted by Department of Public Health on September 13, 1960. Enforceable by the state if localities fail.

2. Regulations Governing Disposition of Petroleum Products in Inland Waters. Enforced by Board of Fire Prevention, Department of Public Safety. CH. 148, Sec. 9 and 10 of General Laws.

3. Regulations of Department of Public Health to prevent pollution or contamination, September 9, 1945. States no sewage, garbage, manufacturing refuse or waste water may be discharged into stream except by method approved by Department. CH. 111, Sec. 5 of General Laws.

4. Pollution control laws apply to Governmental agencies. CH. 552.

5. Department of Public Health control over unsatisfactorily-operated sewage disposal systems. CH. 83, Sec. 7.

6. Department of Public Health regulations to prevent pollution of public water supply. Rules of October 1960.

7. Supervision of discharge of waste material into inland waters affecting fish and fisheries. Division of Fisheries and Game. CH. 131, Sec. 28 and 29.

8. Department of Public Health has power to protect the Charles River and tributaries and adjacent areas from pollution. Fines provided. CH. 453, Acts of 1963.

9. Massachusetts Clean Waters Act, CH. 685. Signed September 6, 1966.

A. Establishes a Division of Water Pollution Control within the Department of Natural Resources to enhance the quality and value of water resources and to establish a program for the prevention, control and abatement of water pollution. To plan, handle funds, study, draw up standards, examine water quality (plans to be approved by the Water Resources Commission).

B. Sets up districts consisting of one or more cities and towns. District to have an advisory council, commission, director and treasurer. May enter into contracts, issue bonds, manage facilities, construct or improve facilities, have power of eminent domain, receive federal and state funds.

C. Reimbursement on bond payments to municipal abatement projects already built on or before December 31, 1957.

D. Reservoirs and demonstration projects may be included.

E. Penalties provided. Attorney General may bring action and courts have jurisdiction in equity to enforce.

10. Financial Aid for Water Pollution Control, CH. 687, Acts of 1966. Authorizes Division of Water Pollution Control of Department of Natural Resources to spend not more than $150,000,000 to aid cities and towns in projects, surveys, plans and construction of abatement facilities. Includes treatment for sewage, industrial and other wastes; sewers and lines; pumping stations. Division may sell bonds of the Commonwealth. Division may accept federal funds.

11. Amendments to Massachusetts Clean Waters Act, CH. 873, Acts of 1967.

A. Technical wording change to clear up ambiguity between CH. 685 (establishing districts) and CH. 687 (authorizing funds to cities and towns).

B. Prefinancing provision encourages districts to proceed with projects even though federal money not available at the moment. $2,000,000 limit.

C. Authorization of limit of $1,000,000 for research and development.

D. $2,000,000 of original $150,000,000 authorized by CH. 687 may be used for purchase of land for low-flow impoundments.

12. Exemption From Taxation of Property, CH. 700 of Acts of 1966. Grants businesses exemption from taxation of property used for abatement or prevention of water pollution. Does not include facilities whose primary purpose is salvaging usable or marketable material. Director of Division of Water Pollution Control certifies to assessors that property is effective for control. Note: 1967 amendment in tax bill allows exemption for any facility started on or after January 1, 1966.

13. Reduction and Exemption of Corporation Excise, CH. 701 of Acts of 1966. Provides elective reduction and exemption under the business and manufacturing corporation excise for construction or improvement of industrial waste treatment facilities. Affects net income subject to tax from which corporation may deduct expenditures incurred for improvement. Facilities must be certified by Director of Division of Water Pollution Control.

State Laws - Land Control

1. Massachusetts Bay Circuit, CH. 631, Laws of 1956. Commissioner of Natural Resources authorized to acquire and develop green belt circling Boston from Ipswich to Duxbury. To coordinate public and private lands. Proposed circuit crosses the Charles River in area of Sherborn, Medfield and Millis.

2. Self-Help Program, administered by Department of Natural Resources. For acquisition of land by local Conservation Commissions. Localities may receive up to 75% of cost of land, with Bureau of Outdoor Recreation contributing half and the State Self-Help funds contributing half of the remainder.

3. Hatch Act, CH. 220, Acts of 1965.

A. Commonwealth, through Department of Natural Resources, has jurisdiction to review plans to fill a wetland if flow of water or water supply would be adversely affected.

B. Procedure: 30 days before start of project, plan filed with local officials; Department's Division of Conservation Services is informed and receives plan; Division clears it with Public Health, Fisheries and Game, Public Works, Water Resources Commission and Department's Division of Law Enforcement; report returned to local officials; hearing; decision by local Government officials.

State Study of Wetlands

1. Study of Inland Wetlands and Flood Plains. Authorized by legislature, 1966., CH. 89 of Resolves. Study by Department of Natural Resources investigated areas of 10 acres or over. Rated and valued areas in 9 categories:

recreation
wildlife
water supply
flood control
agriculture
development
nature study
aesthetic value
historic value

Areas then given priority rating as to urgency of need to protect. Each area also given rating as to potential value. Problems of the study:

determination of ownership
establishment of flood plain line

2. Report of Inland Wetlands Study, June 5, 1967, Document No. 1273.

Summary: Total wetlands over 10 acres, 309,413 acres (6% of the land in the state):

Loss of 1% of this acreage per year
Little protection by zoning
Little hydrologic information
Less than 1% of this acreage in public ownership

Recommendations:

Stop using wetlands for solid waste disposal
Have an acquisition program
Have uniform watershed zoning, possible statewide zoning
Pass new legislation

Federal Laws and Programs

1. ADVANCE PLANNING AND CONSTRUCTION ACT. PL83-560. Department of HUD. 100% interest-free advances to assist planning for local public works (including sewer systems). Also area-wide and long-range projects. Advance repayable at start of construction.

2. CONSOLIDATED FARMERS HOME ADMINISTRATION ACT OF 1961. PL87-128 as amended by the Rural Water and Sanitation Facilities Act of 1965, PL89-240. FHA program for development of water and sewer systems in rural areas of less than 5,500 population. Administered by Department of Agriculture. 50% grants or 100% loans or insured loans.

3. FEDERAL WATER POLLUTION CONTROL ACT. PL84-660. As amended by the Federal Water Pollution Control Act Amendments of 1961, the Water Quality Act of 1965 and the Clean Water Restoration Act of 1966. Purpose is to enhance quality and value of water resources and establish national policy for prevention, control and abatement of water pollution. Among its provisions:

A. Grants Program.

1) Waste Treatment Works Construction. To municipal, inter-municipal, state or interstate agencies for projects to prevent or control pollution. 30% federal share; 40% if state contributes 30%; 50% if state has enforceable water quality standards and contributes at least 25%; 10% increase in grant if project is part of comprehensive metropolitan plan.

2) State and Interstate Agency Programs. To state and interstate water pollution control agencies for administration.

3) Comprehensive Basin Plans for Water Quality Control and Abatement. To planning agencies, not over 50% of administration costs for three years.

4) Research and Development. For development of new and improved methods of controlling pollution. Concerned with storm and combined sewers; advanced waste treatment and joint treatment of municipal and industrial wastes, methods of treating industrial wastes.

5) Research, Training, Demonstration and Research Fellowships. To agencies, institutions or individuals for studies and training.

B. Administration in Department of Interior (formerly HEW).

C. Interstate cooperation by agreement or compact is encouraged.

D. Water Pollution Control Advisory Board created. Chairman plus nine members appointed by the President.

E. Water Quality Standards. States shall adopt water quality criteria for interstate and navigable waters and plan of implementation and enforcement. If state does not, then federal Government will. Thereafter "the discharge of matter into such interstate waters which reduces the quality of such waters below the....standards established.... is subject to abatement". (See special chapter on Water Quality Standards.)

F. Setting up of program such as New England River Basins Comprehensive Water Pollution Control Program. (See special chapter.)

4. FLOOD CONTROL ACT OF 1960. City or town may apply to state Water Resources Commission for study of potential flooding at no cost to locality. Commission coordinates requests and prepares priority list. Study done by Corps of Engineers using priority list (depending on availability of funds).

5. HIGHWAY ACT. Beginning in May of 1965, use of federal highway funds requires consultation between highway planners and State Department of Natural Resources. Advisory only.

6. HOUSING AND URBAN DEVELOPMENT ACT OF 1965. PL89-117. Administered by Department of HUD. Up to 50% grants; higher if community is under 10,000 population and a depressed area. Matching grants to:

A. Localities with construction of public water facilities and sewers consistent with comprehensive plan. Not for repair or maintenance.

B. Agencies for financing site acquisition.

C. Agencies for urban beautification and improvement.

D. Agencies to acquire and develop land for recreation, conservation and other use in accordance with a comprehensive plan.

7. LAND AND WATER CONSERVATION FUND OF 1965. PL88-578. Administered by Bureau of Outdoor Recreation. To any Governmental unit for acquisition, planning and development of recreation land and waters. Reviewed by State Department of Natural Resources. Part of comprehensive plan.

A. Revenue from appropriation, fuel, tax for motor boats, proceeds of sale of surplus federal property, fees charged at federal recreation areas.

B. Funds to states and localities (60%), to federal agencies (40%).

8. NEW ENGLAND RIVER BASINS COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM. Administered by Federal Water Pollution Control Administration. (See special chapter on this program.)

9. OIL POLLUTION ACT OF 1924. Amended in 1966 to transfer administration of law to Department of Interior. Unlawful to discharge oil into navigable waters and adjoining shoreline except for emergency or unavoidable accident. Penalties and fines.

10. PUBLIC WORKS AND ECONOMIC DEVELOPMENT ACT OF 1965. PL89-136. Administered by Economic Development Administration in Department of Commerce. For areas of redevelopment. Direct grants not to exceed 50% for sewage and waste disposal facilities. Can be supplement to PL660 grants (which see).

11. SOLID WASTE DISPOSAL ACT OF 1965. PL89-272. Administered by Department of HEW, Public Health Service, Demonstration grants. 2/3 of cost to develop feasible waste disposal methods.

12. WATER RESOURCES PLANNING ACT OF 1965. PL89-80. To coordinate planning for an entire river basin. Made possible formation of river basin water resources commissions such as the New England River Basins Commission (which see).

13. WATER RESOURCES RESEARCH ACT OF 1964. PL88-379. Broadened in scope by PL89-404. Provides grants to land-grant colleges for water resource research. (See University of Massachusetts.) Grants or matching funds to other institutions, agencies, private firms or individuals for research.

14. WATERSHED PROTECTION AND FLOOD PREVENTION ACT OF 1954. PL566. Amended in 1961 by PL87-170 and in 1962 by PL87-703. Administered by Soil Conservation Service. Federal sharing of cost, technical assistance and credit to watershed project in a watershed of under 250,000 acres. Local initiative. Application through Conservation District. State review

by Water Resources Commission. May include:

A. Flood prevention, water management, recreation.

B. Fish and wildlife.

C. Soil and water conservation methods on private and public land and structures.

D. Not for operation or maintenance costs.

E. Limit to federal share and size of structure.

15. WETLANDS BILL OF 1961. PL87-577. Migratory Bird Conservation Commission approves acquisition of wetlands to preserve migratory birds. State must pass enabling legislation. Loan fund to buy or lease land, repayable from waterfowl stamp sales. Operation of preserves by Federal Fish and Wildlife Service.

SOME PRIVATE ORGANIZATIONS
(Local Organizations Not Included)

ASSOCIATED INDUSTRIES OF MASSACHUSETTS. 4005 Prudential Tower, Boston, 02199. Walter P. Muther, Legislative Counsel; William J. McCarthy, Associate Counsel. Interested in water pollution control from point of view of industry.

AUDUBON SOCIETY, MASSACHUSETTS. Drumlin Farm, Lincoln, Mass., 01773. Allen Morgan, Executive Vice President. Leading conservation organization, providing services and materials. See Conservation Services Center.

BOSTON SOCIETY OF LANDSCAPE ARCHITECTS. Vincent Merrill, 45 Bromfield Street, Boston. One of first organizations to study the Charles River.

CHARLES RIVER WATERSHED ASSOCIATION, F. E. Whitmarsh, Chairman; Mrs. Arno Heyn, 21 Alexander Road, Newton, Secretary. Nonprofit association to protect and improve recreational opportunities of natural resources of watershed. Has established a water-testing system for detection of coliform bacteria in conjunction with Norfolk Conservation Commission.

CIVIC CENTER AND CLEARING HOUSE. 14 Beacon Street, Boston. ~~John Putnam~~, Director A clearing house for volunteers with referral to other organizations. Projects of its own, including urban conservation, historical preservation, file of information on environmental health at State Library and at Waltham Field Station. Also sponsorship of courses on pollution control.

CONSERVATION FOUNDATION. 1250 Connecticut Avenue, Washington, D.C. Sydney Howe, Director.

CONSERVATION LAW FOUNDATION, INC. 1 Court Street, Boston, 02108. Arnold W. Hunnewell, Jr., President. To promote use of law in behalf of conservation of natural resources. A clearing house of conservation legal matters.

CONSERVATION SERVICES CENTER. Drumlin Farm, Lincoln, Mass., 01773. Wayne Hanley, Editor-in-Chief. Use of Ford Foundation funds to strengthen information activities of conservation organizations. Offers facilities, advice, source file, art work, production service, film.

GARDEN CLUB FEDERATION OF MASSACHUSETTS, INC. Mrs. Ralph H. Davis, President; Miss Elizabeth O'Dougherty, Wayland, Mass., Conservation Chairman Fosters interest in conservation, provides lectures, sponsors conferences.

ISAAK WALTON LEAGUE. 719 13th Street, N.W., Washington, D.C., 20005. Massachusetts representative is Malcolm Johnston, 271 Centre Street, Dorchester, 02122. General interest in water conservation, special interest in fishing. Publishes magazine "Outdoor America". Ran Boston conference on water quality.

LEAGUE OF WOMEN VOTERS OF MASSACHUSETTS. 120 Boylston Street, Boston, 02116. Water Resources Chairman, Mrs. Roger A. Walke, Jr.

LEAGUE OF WOMEN VOTERS OF THE UNITED STATES. 1200 17th Street, N.W., Washington, D.C., 20036. Water Resources Chairman, Mrs. Donald Clusen.

MASSACHUSETTS ASSOCIATION OF CONSERVATION DISTRICTS. Horace Clarke, President. 450 Maple Street, Danvers. Nonprofit association of Conservation District officials.

MASSACHUSETTS ASSOCIATION OF CONSERVATION COMMISSIONS. 84 State Street, Room 505, Boston, 02109. Jules P. Sussman, President; Stuart DeBard, Executive Secretary. Nonprofit association composed of all conservation commissions with exception of those requesting otherwise. To coordinate activities of conservation commissions with state and private groups; to take stands on legislation. Publishes handbook.

MASSACHUSETTS CONSERVATION COUNCIL, INC. P.O. Box 315, Lincoln Center, 01773. Dr. Conrad Chapman, Chairman, Coordinates 25 organizations interested in conservation.

MASSACHUSETTS FOREST AND PARK ASSOCIATION. 1 Court Street, Boston, 02108. Benjamin Nason, Director. Leading conservation organization taking stands on legislation. Distributes information and publications on conservation.

MASSACHUSETTS STATE FEDERATION OF WOMEN'S CLUBS. 115 Newbury Street, Boston, 02116. Mrs. Frederic J. Christiansen, Conservation and Gardens Chairman. Sponsors lectures, encourages general interest in conservation.

MASSACHUSETTS WILDLIFE FEDERATION. Chester Spencer, Chairman, 11 Chamberlain Street, Arlington. Interested in conservation from sportsman's viewpoint.

NATIONAL WATERSHED CONGRESS. 1025 Vermont Avenue, N.W., Washington D.C., 20005. Massachusetts representative: Benjamin Isgur, 29 Cottage Street, Amherst, 01002. Boston was location of 14th congress in 1967.

NATURE CONSERVANCY, Washington, D.C., Thomas W. Richards, National President; Dr. George Shattuck, 25 Shattuck Street, Brookline, 02146, Massachusetts chairman. Promotes interest in conservation and owns land.

NEW ENGLAND FORESTRY ASSOCIATION. 1 Court Street, Boston. John T. Hemenway, Chairman.

STATE COUNCIL OF SPORTSMEN'S CLUBS. Edward Govoni, President; Legislative representative, Erwin S. Wilder, 319 Linwood Street, Lynn. Interest in conservation from point of view of sportsman. Active in taking stands on legislation.

TRUSTEES OF RESERVATIONS. 224 Adams Street, Milton. Charles R. Strickland, President; Gordon Abbott, Jr., Director; Loring Conant, Executive Secretary. Incorporated to acquire and hold lands and sites for public benefit. In the Charles River Valley these are:

A. Charles River Peninsula. Needham. From south side of Fisher Street, take lane adjacent to tracks at Charles River railroad station. 29 acres acquired in 1960, once pasture of Walker Gordon Farm.

B. Medfield Rhododendrons, Medfield. On southwest side of Route 27 opposite Kingsbury Pond, about half mile from village to south. 109 acres acquired in 1934. 20 acres added in 1961. On Stop River.

C. Noon Hill, Medfield. On Noon Hill Street, a dirt road leading off South Street. 52 acres acquired in 1959. Addition acquired in 1960 and 1963.

D. Rocky Narrows, Sherborn. Accessible by canoe, one mile upstream from Farm Street Bridge. 53 acres donated in 1897, 1941 and 1942. Next to Sherborn Town Forest.

WATER POLLUTION CONTROL FEDERATION. 3900 Wisconsin Avenue, Washington, D.C. Local officer is Joseph B. Hanlon, 23 Hatherly Road, Quincy. Emphasis on disposal of sewage and industrial waste. Publishes newsletter "Highlights", a "Journal", and other material.

SOME GOVERNMENT COMMITTEES AND COMMISSIONS

State

ADVISORY COMMITTEE TO THE DEPARTMENT OF NATURAL RESOURCES ON OPEN SPACE AND RECREATION. Appointed by the Governor. 21 members. Thaddeus Beal, Chairman; Gordon Abbott, Secretary.

SENATE SPECIAL COMMITTEE ON WATER POLLUTION. Senator Joseph Ward, Chairman.

HOUSE COMMITTEE TO STUDY WATER POLLUTION. Representative Raymond F. Rourke, Chairman.

SPECIAL LEGISLATIVE OVERSIGHT COMMISSION. To oversee implementation of water pollution control laws. Senator Joseph Ward, Chairman; Representative Rourke, Vice Chairman.

Federal

CORPS OF ENGINEERS STUDY COMMITTEES. (See page 43 for listing of committees participating in the Charles River Study.)

PRESIDENT'S WATER POLLUTION CONTROL ADVISORY BOARD. Created by the Clean Water Restoration Act of 1966. 9 members plus chairman appointed by The President. 3-year terms.

SPECIAL SENATE SUBCOMMITTEE ON AIR AND WATER POLLUTION. Senator Edmund S. Muskie of Maine, Chairman.

WATER RESOURCES COUNCIL. Established by Water Resources Planning Act to formulate and review plans. Consists of: Secretaries of Interior, Agriculture, Army, HEW and Chairman of Federal Power Commission.

NEW ENGLAND RIVER BASINS COMPREHENSIVE WATER POLLUTION CONTROL PROGRAM

Scope

Authorized by the Federal Water Pollution Control Act, the New England River Basins Comprehensive Program is under the Federal Water Pollution Control Administration. Its office is at 240 Highland Avenue, Needham Heights, it has a staff of 13 and operates with $170,000 of federal funds. It places pollution control on a river basin basis and has as its goals:

1. Solution of complex water quality problems on a regional basis;

2. Development of a framework of laws, statutes, authorities and responsibilities for water quality management. In this work the Program works closely with state agencies, the MDC, the Corps of Engineers and the New England River Basins Commission on water quality management.

Work in the Charles River Area

The Program has finished a water quality investigation of the Charles River and Boston Harbor and has published two very detailed reports on both the chemical and physical aspects of water quality in the area and also on the biological aspects, together with a summary (see section on Selected References). These studies were conducted in cooperation with the MDC and the state's Water Pollution Control Division. During a one-month period in the summer of 1967 over 700 water samples were taken from the river and harbor as well as samples of bottom material using 17 sampling stations on the Charles River. These were located along the river and on two tributaries from above Milford to the Charles River Dam. Tested were: biological oxygen demand, coliform and salmonella bacteria, suspended solids, color, turbidity, nitrogen concentrations, and phosphorus concentrations.

Results of Studies

The studies revealed degradation of water quality and sludge deposits from wastes originating in Milford with additional waste contributions downstream from this,making a 32-mile stretch of polluted conditions through Medfield. Improved conditions prevail in the middle of the river to Wellesley, but nutrients from upstream cause dense growths of plants and algae. Below Wellesley the quality of the river deteriorates. Combined sewers discharge into the river as it flows through the metropolitan Boston area, finally causing "severely degraded" water in the Lower Basin where conditions are apparently so toxic that even animal life tolerant to pollution is not supported.

The data which was gathered will serve to develop a "mathematical model" of the river. This model will make it possible to predict the response of the river to pollution loads, variations in flow, temperature changes and other forces which act upon the quality of the Charles River. The output of the model will serve to delineate the framework of action needed to achieve the established water quality standards. (See chapter on Water Quality.)

CORPS OF ENGINEERS STUDY OF THE CHARLES RIVER

Introduction

By far the most significant planning in the Charles watershed is being conducted by the U.S. Army Corps of Engineers, New England Division, at 424 Trapelo Road, Waltham. Called "A Comprehensive Water and Related Land Resources Investigation of the Charles River Watershed", it was authorized on June 24, 1965 by a resolve of the House Committee of Public Works "with a view to determining the advisability of improvements in the interest of flood control, water supply, recreation, water quality control, navigation, tidal flood control, allied purposes and related land resources".

A 5-year study, the Congress authorized funds for the purpose. The study is making plans to meet the needs outlined above through the year 1980 with indicated potentials to meet the needs through 2020. A "Plan of Survey" and several "Status Reports" are available through members of the Citizen Advisory Committee (see below). Colonel Remi O. Renier, U.S. Army, Division Engineer, Northeast Division, has responsibility for the study. The following agencies have roles in the study:

Federal Agencies

1. Corps of Engineers. Coordination, guidance, data. Flood problems. Navigation needs. Hydrological studies. Inventory and analyze sites for water resource development with Department of Agriculture. Surface water studies. Correlate and consolidate all information. Draft main report.

2. Soil Conservation Service (Agriculture). Agricultural and forest lands. Inventory and analyze sites for water resources development. Appraise agricultural and rural water needs.

3. Economic Development Administration (Commerce). Consultation on regional needs and impact of proposals on redevelopment areas.

4. Bureau of Census (Commerce). Population and economic data.

5. Weather Bureau (Commerce). Meteorological data.

6. U.S. Public Health Service (HEW). Health aspects of pollution. Public water supply. Guidelines for quality of domestic and recreation water. Review plans for sewage treatment plants where effluent affects shellfish.

7. Department of Housing and Urban Development. Information on regional agencies or municipalities receiving federal grants, loans or aid. Coordination of Corps Study with these grants. Develop an open space action program.

8. Federal Water Pollution Control Administration (Interior). Municipal and industrial water supply needs. Basic data on water uses and water sources. Stream flow augmentation requirements. Sources of pollution. Evaluation of benefits and selection of alternative components of basic plans.

9. Bureau of Outdoor Recreation (Interior). Estimates of needs for water-related outdoor recreation. Evaluate recreational potential of water control structures. Recommendations for preservation of scenic and other recreation resources. Estimate of cost benefits.

10. National Park Service (Interior). Effect of proposals on archeological, historic, natural and scientific resources. Identify sites of importance. Investigate possible National Recreation Area status for some sites.

11. Fish and Wildlife Service (Interior). Inventory resources and needs for water-related fishing and hunting. Evaluate potential for hunting and fishing of proposed water control sites. Prepare cost-benefit analysis.

12. Geological Survey (Interior). Groundwater study. Advise on effect of development plans on groundwater.

13. Bureau of Public Roads (Transportation). Information on future highway plans.

14. Bureau of High Speed Transportation (Transportation). Information on future railroad passenger transportation in watershed.

State Agencies

1. Metropolitan District Commission. Originator of the request for the authorized Corps study. Will consult on MDC services as they relate to overall program as well as measures for flow control and water quality improvement.

2. Department of Natural Resources. Consultation on water flow control and water quality improvement. Improvement of water supply and sewage treatment. Consultation on availability for recreation of lands now under Department in watershed. Allocation of B.O.R. funds as it affects overall watershed program for land acquisition and development of water-related lands.

3. Metropolitan Area Planning Council. Consultation and assistance with planning data on population, land use, existing water and sewer facilities, existing open spaces.

(The foregoing are statements of intended participation but are not binding commitments by the participants.)

Committees

The Corps of Engineers has instituted the following committees:

1. Coordinating Committee: Benjamin Isgur, Department of Agriculture; Mark Abelson, Department of Interior; Erwin W. Webber, Department of Commerce; Frank Tetzlaff, Department of HEW;

Frank A. Batstone, Department of HUD; Robert L. Yasi, Department of Natural Resources; Howard Whitmore, Jr., Metropolitan District Commission; Robert G. Davidson, Metropolitan Area Planning Council.

2. Citizen Advisory Committee: Bellingham, Richard Hill; Belmont, William Claflin; Boston, Miss Roberta Chesnut, Mrs. F. Murray Forbes, Frank Christian, Edward J. Logue, Walter M. Whitehill, Arthur Williams; Brookline, Dr. George Shattuck; Cambridge, Dr. Howard McIntyre, Jr., George Orrok, Thomas Prentiss, Nathan M. Pusey, Charles Whitlock; Dedham, Charles Bartlett; Dover, Mrs. Russell Haddleton, Hon. Leverett Saltonstall, Daniel Wheeler; Franklin, Mrs. Thomas Murray; Milford, Robert Symonds; Millis, Mrs. Talbot Baker; Natick, Henri Prunaret; Needham, John Gill; Newton, James A. Miller, Benjamin Shattuck; Norfolk, Kenneth Wood; Sherborn, John Plimpton; Wellesley, Mrs. H. Shippen Goodhue; Weston, Thomas D. Cabot (Chairman); Wilmington, Henry Colombo.

Public Hearings

Public hearings were held by the Corps on January 17, 1967 in Waltham, on January 19, 1967 in Wellesley, and on January 24, 1967 in Franklin. More than 600 hearing notices were widely distributed to Government officials, agencies, postmasters, news, radio and television media, private organizations and private individuals. Information pamphlets were distributed at the hearings and a digest of statements, together with a complete list of those testifying, is available. (See "Conclusion" for text of League of Women Voters statement.)

Other public hearings will be held toward the close of the study.

WATER QUALITY STANDARDS

Introduction

The Federal Water Pollution Control Act as amended (see "Relevant Laws and Programs" for the Water Pollution Control Act) specified that states shall adopt water quality criteria for interstate and navigable waters and then classify its streams with water quality standards. The states then must file with the Department of Interior a plan for implementation and enforcement of these standards. If this was not done before June 30, 1967, the federal Government could then set and enforce standards.

Massachusetts, through its Division of Water Pollution Control, held a public hearing on Criteria and then subsequently public hearing on the standards for the various streams and coastal waters. (See "Conclusions" for the testimony of the League of Women Voters.) The hearing for the Charles River and others was held on April 14, 1967.

Criteria - Standards of Quality for Fresh Waters

Massachusetts adopted water quality standards on March 3, 1967 in accordance with the provisions of Section 27(4) of Chapter 21 of the General Laws and with the procedure required by Chapter 30A of the General Laws and after a public hearing held on February 17, 1967. A full statement is available from the Division of Water Pollution Control, but this is a brief summary:

Class A - Waters designated for use as public water supplies in accordance with Chapter 11 of the General Laws. Character uniformly excellent.

Class B - Suitable for bathing and recreational purposes including water-contact sports. Acceptable for public water supply with appropriate treatment. Suitable for agricultural and certain industrial cooling and

process uses; excellent fish and wildlife habitat; excellent aesthetic value.

Class C - Suitable for recreational boating; habitat for wildlife and common food and game fishes; certain industrial cooling and process uses; under some conditions acceptable for public water supply with treatment. Suitable for irrigation of crops used for consumption after cooking. Good aesthetic value.

Class D - Suitable for aesthetic enjoyment, power, navigation and certain industrial cooling and process uses. Class D will be assigned only where a higher water use cannot be attained after all appropriate waste treatment methods are used.

Water Quality Classification of the Charles

The federal law specifies that "standards of quality established .... shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of this Act". It further says that "the appropriate state authority shall take into consideration their (the standards) use and value for public water supplies, propagation of fish and wildlife, recreational purposes, agricultural, industrial and other legitimate uses".

The Charles River waters were classified A, B, and in some areas C, although as it is an intra-state stream, these classifications have not been submitted to the federal Government for approval.

All waters not specifically classified, including feeder streams and ponds, are automatically Class B. It is understood that all C classifications will be reviewed within five years with a view to upgrading them.

Commonwealth of Massachusetts
Water Resources Commission
Division of Water Pollution Control

CHARLES RIVER BASIN CLASSIFICATION

BOUNDARY	PRESENT USE	ANTICIPATED FUTURE USE	PRESENT CONDITION	CLASSIFICATION
The Charles River from its source to Dilla Street, Milford	Water Supply	Water Supply	A	A
The Charles River from Dilla Street, Milford to Main Street, Milford	Bathing Fish & wildlife propagation Fishing	Same	B	B
The Charles River from Main Street, Milford to Bridge Street, Dover	Recreational boating Fish & wildlife propagation Fishing Assimilation	Same	D & C	C
The Charles River from Bridge Street, Dover to Watertown Dam, Watertown	Recreational boating Fish & wildlife propagation Fishing Assimilation	Same and Bathing	D & C	B
The Charles River from Watertown Dam, Watertown to the Charles River Basin Dam in Boston	Recreational boating Fish & wildlife propagation Fishing Assimilation	Same	D & C	C
Medfied Farm Pond, Sherborn	Water Supply	Water Supply	A	A
All other streams in the Charles River Watershed unless denoted above	--	--	-	B

COMMONWEALTH OF MASSACHUSETTS
WATER RESOURCES COMMISSION

CHARLES RIVER BASIN

CLASSIFICATION

WATER USE CLASSES - (A) (B) (C) (D) (SB)

— CHANGE CLASSIFICATION

Preliminary Implementation Schedule for the Charles

Letters establishing implementation schedules have been sent to two municipalities and eight industries. A survey currently underway is expected to uncover the names of additional polluters who will likewise be notified to cease their pollution by established dates. Meantime, the following are covered in the first implementation schedule:

1. Municipalities

A. Franklin: Sewerage system. Appropriation of funds by June of 1968; construction to begin March of 1968; completion, March of 1969. Enlargement of secondary treatment required.

B. Medway: Sewage treatment. Acquisition of site, June of 1970; final plans, February of 1971; completion, April of 1972. Secondary treatment required.

2. Industries

A. Bettinger Corporation, Milford: Preliminary report by September 1968; final plans by February 1969; complete construction by October 1969.

B. Cliquot Club Bottling Company, Millis: Preliminary report by April 1970; final plans by February 1971; start construction, April of 1971; completion by April 1972.

C. Medway Woolen Mills, Medway: Final plans by February 1971; start of construction, April of 1971; completion by April 1972.

D. Ruberoid Company, Millis: Preliminary report by August 1968; final plans by February 1969; completion of construction by September 1969.

E. Stylon Corporation, Milford: Preliminary report by September 1968; final plans by February 1969; completion of construction by October 1969.

F. Tillotson Rubber Company, Needham: Preliminary report by February 1968; final plans by May 1968; complete construction by October 1968.

G. Unionville Woolen Mills, Franklin: Preliminary report, June of 1968; final plans, March of 1969; construction by May 1969; completion by December 1969.

H. Your Laundry, Medway: Preliminary report by June 1968; final plans by September 1968; complete construction by April 1972.

SEWAGE DISPOSAL FACILITIES

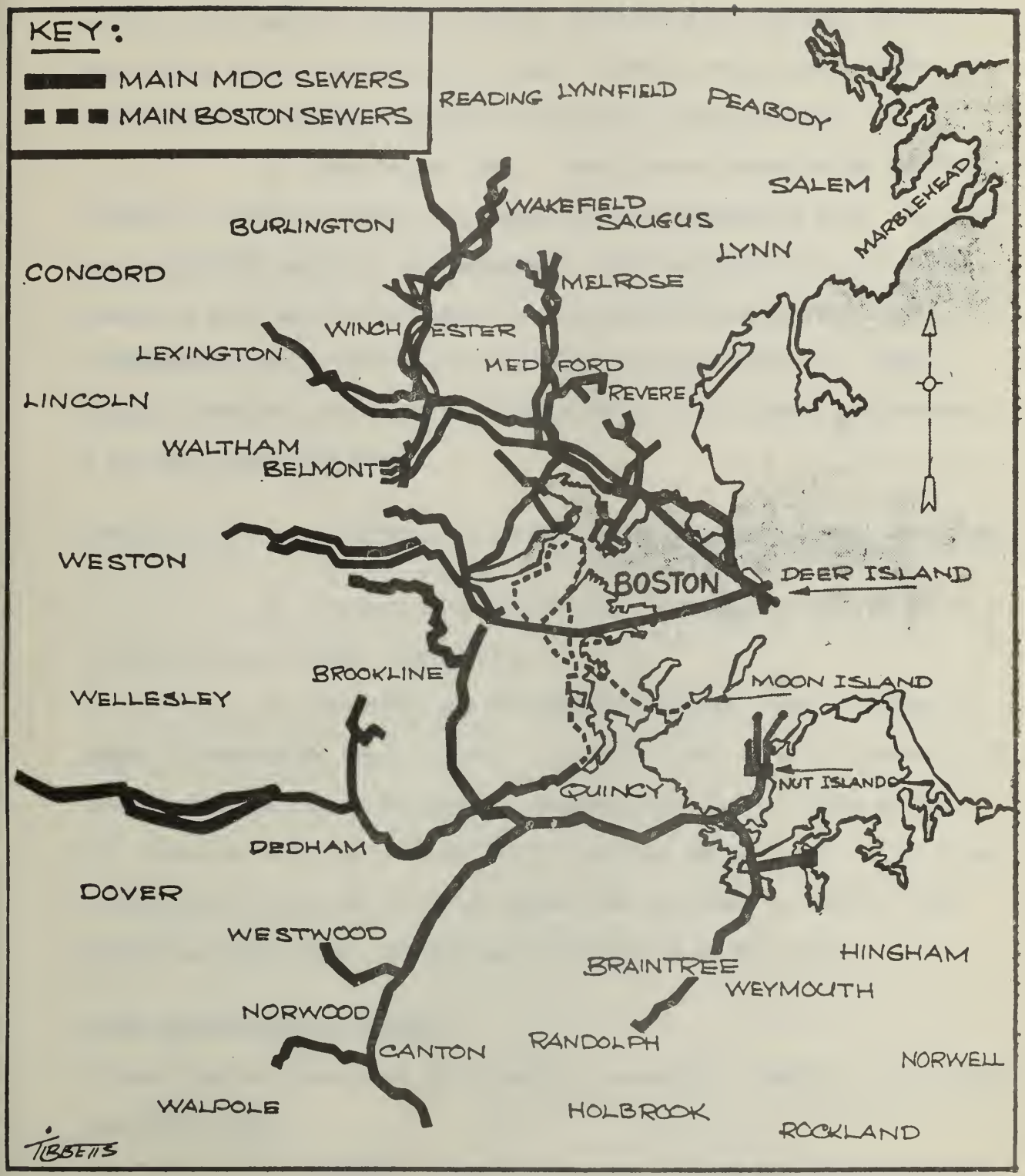
Introduction

As one of the important sources of pollution in the Charles watershed is sewage, it seems appropriate to give special emphasis to sewage disposal facilities - or the lack of them. According to the FWPCA, for instance, there are 17 combined sewer overflows on the MDC Cambridge Branch Sewer, 17 on the MDC Charles River Valley Sewer, and 8 on the MDC Boston Main Drainage System. In addition, the City of Boston sewerage system has overflows of combined storm-and-household sewage into the Charles (15) and the Muddy River (2). And yet metropolitan Boston historically was foresighted in its institution of metropolitan sewerage systems and the authorizing of bond issues to update them. In the lower watershed the great problem is the overflowing of combined sewers and the polluted condition of the urban run-off; in the upper watershed the problem is effluent from treatment plants which enters the river and its tributaries, as well as the problems resulting from unsewered areas and reliance on septic tanks and cesspools.

Metropolitan District Commission Sewerage System

The following Charles watershed communities are part of the MDC Sewerage System: Arlington, Ashland, Belmont, Boston, Brookline, Cambridge, Dedham, Lexington, Natick, Needham, Newton, Somerville, Walpole, Waltham, Watertown, Wellesley, Westwood.

Boston still discharges some raw sewage into Boston Harbor at Moon Island, but it is expected that this situation will be remedied during 1968 by connection with the MDC system. The MDC-collected sewage goes either to the Nut Island plant, maintained by the MDC south of Boston near Hough's Neck, or to the Deer Island Treatment Plant north of Boston.



Map Courtesy of Boston Herald-Traveler

A. Nut Island Plant. Primary treatment. 130,000,000 gallons a day average. Built in 1951. Effluent piped one mile out to sea; sludge piped four miles out to sea. Handles sewage from southern part of watershed. Potential capacity is 300,000,000 gallons a day.

B. Deer Island Plant. Installation completed May of 1968. Subject of a special legislative committee investigation in 1968. Designed for 343,000,000 gallons a day capacity. Sewage screened to remove solids, passed to grit channels to remove sand and grit, through aeration and sedimentation tanks, then chlorinated and discharged to ocean. Sludge pumped to digestion tanks where volatile solids are destroyed and produce a gas which fuels the plant.

Projects still to be finished in the MDC system (but already authorized) are:

A. North Charles Relief Sewer, designed to relieve the Cambridge Branch Sewer. Out to bids.

B. Detention and Chlorination Station. Near BU Bridge in basin. Construction begun in 1968. $4,700,000 cost, of which Department of Interior granted aid of $1,000,000. Demonstration grant. Below ground. Will treat up to 233,000,000 gallons of combined sewage a day. Will screen storm overflow, pump to detention chamber for chlorination and then discharge back into river. Sludge remaining will go to MDC sewer.

Local Sewage Treatment Plants

In the upper watershed much of the area is unsewered. However, the following facilities exist:

1. Franklin. Separated sewer. Discharges into Mine Brook. Screening; grit chamber; settling tank; rotary filter; unheated covered digester; gas chlorination. See "Water Quality" section for compliance schedule.

2. Medfield. Separated sewer. Discharges into Charles River. Hopper-type settling tank; sand filter; open sludge beds.

3. Medway. Combined sewer. Discharges into Dark Swamp. Chlorination with hypochlorite. See "Water Quality" section for compliance schedule.

4. Milford. Combined sewer. Discharges into Charles River. Screenings ground up; mechanical settling tank; high capacity trickling filter; gas chlorination; sludge conditioning; sludge dewatering.

5. Millis. Separated sewer. Discharges into Charles River. Aeration; settling tank; chlorination; filter beds. Plans for addition on file with state.

State-Owned Institution Waste Facilities

1. Medfield State Hospital. Separated sewer. Discharges into Charles River. Screens; Imhoff settling tank; intermittent sand filters; gas chlorination; open sludge beds.

2. Norfolk Pondville Sanitorium. Separated sewer. Discharges into Stop River. Same as above, except hopper settling tank.

3. Norfolk and Walpole Prison Colonies. Separated sewer. Discharges into Stop River. Same as above.

4. Wrentham State School. Separated sewer. Discharges into Stop River. Screens; hopper settling tank; rotary distributor filters; gas chlorination; open sludge beds. Has funds for improvement.

Privately-Owned Institution Waste Facilities

1. Dedham Country Day School, Dedham. Discharges into Wigwam Brook. Settling and sand filtration.

2. St. Stephen's School. Dover. Discharges into Charles River. Settling and sand filtration.

3. Regis College. Weston. Primary treatment and sand filtration. No effluent into stream. Filter beds in woods area.

4. Weston College. Imhoff tank. Sand filters into ground.

5. Pine Brook Country Club. Weston. Comminutor. Aeration. Settling tanks. Chlorination, Discharge into Brook.

Federally-Aided Projects

The following valley communities are involved in federal construction grant program projects as of 1968:

	Kind	Total Cost	U.S. Grant
Boston (MDC)	Treatment	$2,672,450	250,000*
Franklin (Application for federal grant is in the works)			
Lexington	Interceptor		49,800
Milford	Treatment	358,430	105,000
Milford	Treatment-Interceptor	267,000	80,000
Millis	Treatment	215,000	64,500
Needham	Interceptor	44,048	13,214
Westwood	Interceptor	174,698	52,409
Westwood	Interceptor	230,424	69,127

*In addition, $1,000,000 for Detention Station, see page 50.

CONCLUSION - POSITION OF THE LEAGUE OF WOMEN VOTERS

National Study

In 1956 and 1958 the National League of Women Voters adopted a current agenda item on water resources. After four years of nation-wide study, the following position was arrived at in 1960:

> Support of national policies and procedures which promote comprehensive long-range planning for conservation and development of water resources. Among these policies are 1) better coordination and elimination of conflicts in basic policy at the federal level; 2) machinery appropriate to each region which provides coordinated planning and administration; 3) cost sharing by Government and private interests in relation to benefits received and ability to pay.

Charles River Study

Many Leagues throughout the country have joined together to study specific river basins and to take effective action. The Charles River Valley Group of the League of Women Voters was founded in May of 1963 and at present consists of 18 Leagues in the Charles watershed. The group has consulted experts and officials, presented speakers, conducted tours of the river, photographed and mapped the river, written and distributed research materials, and conducted discussions within each local League. As a result, we arrived at the following consensus:

> Support of measures leading to an overall plan for the Charles River watershed, recognizing multiple uses such as pollution control, water supply, recreation, beautification, conservation, requirements of housing and urban development, industrial needs, flood control and low-flow alleviation.

LEAGUE STATEMENT AT CORPS OF ENGINEERS HEARINGS, JANUARY OF 1967

General

1. We appreciate very much the opportunity of making a statement this evening. We compliment the federal Government on the new approach to river basin planning described by Lt. General Cassidy who called water "an indivisible resource". In addition, we are very appreciative of the help and information which has been given to us not only by the Corps of Engineers but also other Government agencies who seem to have an increasing sense of partnership between Government agencies and citizens.

2. The watershed has many assets, many interested Government agencies and citizens. These groups have combined in the past to take imaginative action in the watershed such as, to name a few, the park system, the formation of the Metropolitan District Commission, and the building of the Lower Basin. Another asset is the fact that, even though the Charles River exists almost entirely within the metropolitan statistical area, nevertheless some extraordinary natural areas have been preserved. The river is not used for mechanical power or irrigation for farming and has limited use for manufacturing processes and transportation, but its potential for water supply and recreation are great.

Watershed Characteristics

We are concerned particularly about the watershed. Due to growing population it is becoming more and more urbanized even in the upper valley and pressures exist everywhere to fill in wetlands, to develop right up to the river edge, and to hard-top widely. Much of the upper valley is unsewered. And while the potential water supply is being endangered, the demands for water are expanding. We recognize the need for industrial development and for increased

housing but feel that planning could make such development an addition to environmental beauty rather than a detriment. The Charles is a river, almost more than any we know about, which is "an enterprise of the entire community". We hope that business and real estate, as well as conservationists and recreation enthusiasts, will be encouraged to take a creative part in the interest of the Charles River.

Accessibility

One thing which we have noticed during our many explorations of the Charles River is its general inaccessibility. In the lower river the MDC has ownership of much of the adjacent land and this has made it easy for the public to reach the river (although highway building has tended to make some of this access hazardous). But in other parts of the river access is difficult without trespassing. We encourage more projects such as the one under Echo Bridge and at the South Natick dam, both demonstrating that such access sites do not have to be large-scale.

Water Quality

We shall be making a statement before the upcoming Water Quality Hearings. Here we would only like to repeat the four methods of pollution control mentioned by Mr. Coulter of the Federal Water Pollution Control Administration and urge that all be taken into account during planning:

1. Alteration of land use, manufacturing process, and public practices to reduce polluted discharge.
2. Collection and treatment of waste (solid as well as sewage).
3. Regulation of waste discharge.
4. Regulation of stream flow.

Steps one, two, and four seem especially important to the Charles River. Regarding land use, regretfully public practices have often been remiss

with dumps of municipalities and state institutions especially noted. We have seen the very few municipal sewage treatment plants in the upper valley already overtaxed by growing population or hindered by inadequate equipment - yet even these communities are to be commended in a situation where so many provide no sewage service at all.

Water Flow (Flood and Low-Flow)

1. Flood. Although we are now in drought years*, we remember the floods of the hurricanes and a few conditions of more recent vintage due to rapid run-off in the Lower Basin area. But we have not seen flood line maps or dollar statistics indicating the amount of flood damage - either actual or potential - so we cannot judge intelligently. Before the citizens are asked to make judgments as to the building of structures for the control of possible floods along the river course, we suggest more information be collected and made available so that cost benefits would be known. This would give us the "comprehensive public viewpoint", called for by the President's Water Resources Council.

2. Low-Flow. There seems to be no doubt that low flow is one of the Charles River's great problems, and the startling figures of stream flow taken at the Charles River Village in August 1966, compared with figures taken in March 1966, bear out the fact that the variation is enormous. If impoundment is proposed for the upper watershed, as seems necessary, we urge that it not be unsightly and not damage a major wildlife area. Realizing that the final decision is as much political as technical, we might prefer the preservation of a major wildlife area, even if the "taken" properties might be more productive of tax revenue. We suggest that it might also be fruitful to make a careful cost-benefit study of the Mother Brook, not only as it affects the Charles, but also the Neponset.

*Written 14 months before the floods of March 1968

Water Supply

Several communities take part or all of their supply from the river, others take from wells adjacent to the river or depend on wells in the watershed. It makes sense to suppose that our need for water will increase. We need a master plan of both surface and sub-surface water storage so that future site selection for both housing and industry will not destroy natural drainage areas.

Land Use

We are concerned not only about adjacent land use, but also land use in the entire watershed. We look forward to the Inland Wetlands Survey by the Department of Natural Resources and hope that the Metropolitan Area Planning Council solid-waste-disposal study will be expanded by the present study to cover the entire watershed. At the moment there are many small abuses of the quality of the river banks, some of which are illegal and all of which could be eliminated by good planning, good sense, and good will. These abuses exist behind homes, stores, offices and factories, alongside highways, and at places of both informal and municipal dumping.

Natural Areas

There should be constant planning for the enhancement of and preservation of fish and wildlife areas and wetlands. Some areas are plainly too valuable to be developed, and we hope that the watershed will not be overplanned. A few marvelous natural areas should be "untouchable", such as Hemlock Gorge, the "lake district" in Weston and Waltham, the several marshes, as well as the brook area between Milford and Echo Lake.

Recreation and Environmental Beauty

It is clear that more people are demanding recreation due to increased

population and also increased popularity of water-related sports. And quite apart from active recreation the Charles River can increase its value to people as a place to work, to study, and to live. We are happy to see that recent emphasis is on environmental beauty in Government projects and Government directives.

Fiscal Support

The League of Women Voters always includes in its support positions a provision of support for adequate financing of these positions, and we stand ready to support fiscal or legislative measures which will implement our recommendations.

Inter-agency Coordination

While the federal Government is taking the lead in this study of the Charles River, it does not have all responsibility. The policy-making decisions should be a coordinated effort at all levels of Government. Therefore, the League is glad to see that a Coordinating Committee of officials has been instituted, and we hope it continues. Our studies show that inter-agency coordination has been insufficient. We express our concern with the number of studies relating to the river - the Corps of Engineers study, the study of the Metropolitan Area Planning Council, the Open Space Survey of the Department of Natural Resources, and the study proposed by Congressman O'Neill for examples. We hope these will result not simply in multiplicity but rather in concerted action.

Citizen Participation

We support the proposed citizen's committee and urge that it be formed now. We further urge that this committee have some part in policy-making and that the committee includes all segments of interest in the river, as well as a

generous number of citizens without a special interest. The following steps should be covered:

1. Data: We note need of hydrologic data, flood data, quality classifications and a really useable surface map of the river. We urge that this material be made generally available.

2. Alternatives: In the Government's document, MAJOR STEPS OF WATER RESOURCES DEVELOPMENT, we note that step number six is the formulation of alternative plans. This would assure the policy makers a flexibility of choice, and we urge that these be prepared.

3. Hearings. We hope that there will be another series of hearings at the time of the presentation of alternatives.

Conclusion

In conclusion, the League of Women Voters and its Charles River Valley Group appreciate your attention. We assure you that in the months and years to come members of the League will continue to inform themselves, support measures to improve the Charles River and, in general, to consider the Charles as one of our most important "continuing responsibilities".

OUTLINE OF STATEMENT MADE BEFORE CORPS OF ENGINEERS REGARDING THE LOWER CHARLES (BOSTON THROUGH WALTHAM)

Banks

1. More public ownership. General appreciation of fact that MDC owns so much. But there could be more public ownership.
2. Access by public. Fairly good access in many places, but this could be improved in view of fact that river at Lower End is in area of 1,000,000 people. More paths.
3. Landscaping to add to beauty of banks.
4. Parking lots away from the river bank.
5. Problem of rats.

Water Pollution

1. Salinity and oil slime due to boats and barges using basin and lock.
2. Debris. Especially from boating, railroad yards, canals and wash from parking lots.
3. Combined sewer overflow. To be partially handled by new MDC federally aided construction, but more thought to uncombining sewers.
4. Pollution of tributaries.
5. Urban run-off.

Dumping

1. Dumps at banks of main river and of tributaries (Waltham, Newton, Watertown) by municipalities.
2. Dumping into main river and tributaries by industry. (Sawin Pond, Silver Lake, Beaver Brook).

Recreation

1. Boating in Lower Basin one of most valued assets of river.
2. But some uncontrolled boating, especially in Waltham.
3. Swimming possible at Magazine Beach, Cambridge, in 1952.

Housing and Urban Development

1. Recognition of fact that river is asset to real estate values.
2. Good place to build motels, apartments, but these could be additions to beauty of urban river not detriment.
3. Especially ugly unplanned commercial development on banks between Watertown and Waltham.

Industrial Uses

1. River needed for transportation (especially barges).
2. Also for processing and cooling.

Flooding

1. Can see how rapid run-off from urban areas would make for flash floods - not helped by upstream impoundment.
2. Some flooding in brooks - partly due to filling of ponds such as Silver Lake, Sawin Pond, Totten Pond, Plympton Pond, and filling of wetlands.

Conservation

1. Important in urban area to have even small-scale conservation in mind.
2. Need for more Conservation Commissions.

Tributaries

1. Preservation of tributaries from further culverting (as with Village Brook, Brookline).
2. Preservation of Muddy Brook in Fenway, originally preserved as natural area by Olmsted's Park plan. Highway ramp construction has marred lower Muddy Brook (although MDC has done much to beautify construction with planting). Future Inner Belt may do same for Muddy Brook at upstream end of park.
3. Even in urban area some wetlands have been preserved as by MDC on Beaver Brook. More wetlands could be preserved as on Sawmill Brook in Brookline.
4. Some industrial pollution on tributaries, Watertown, Belmont, Newton.

OUTLINE OF STATEMENT MADE BEFORE CORPS OF ENGINEERS REGARDING THE MIDDLE RIVER (WESTON THROUGH NATICK)

Banks

1. Preservation of natural banks where they exist.
2. Enhancement of banks and structures where possible, as at Cordingly Dam, where excellent cooperation being shown between Government, industry and business, and private citizen groups for improvement of area.
3. More funds for and concern for landscaping of construction projects. Note raw banks left after MDC flood control project near Kendrick Street Bridge, Newton.
4. Parking lots - hard-topping right up to banks or encroaching on MDC areas.
5. Future of more commercial development - should be planned with eye to environmental beauty.
6. Building in flood plain (especially Dover, Dedham, West Roxbury).
7. Little access to banks outside of MDC strips. Good examples in South Natick and Newton Upper Falls.
8. Fill on river banks and tributaries (behind new Route 1 shopping center in Dedham).

Water Pollution

1. There is some industrial pollution of main river and of tributaries (Rosemary Brook, South Meadow Brook, for instance).
2. Some of the area is unsewered and there is seepage (South Natick, Dover).
3. Storm run-off into river. Directly (in some towns) or as overflow of combined sewer (in others).

Dumping

1. Municipal dumping on tributaries (i.e. by Wellesley in the Fuller Brook) and on main river (by Boston at Cow Island). Also Needham, West Newton.
2. Some informal illegal dumping (old cars, refrigerators, etc.).

Recreation

1. Concern over loss of Norumbega Park - formerly largest recreation area on river which was accessible to public transportation.
2. Some schoolboy rowing and past boating and swimming near Moseley's and Cow Island. Boat rental at Red Wing Bay now only one in this area. More future recreation (boating and swimming) in this area.

3. More control of boating?
4. Formerly excellent fishing - but problem of access as well as of fish. Occasional trout taken from this part, but mostly carp.
5. Some tributaries now used for municipal swim areas (Wellesley, Needham).

Water Supply

1. Several towns are not on MDC and depend on watershed for supply.

Conservation

1. Excellent planning in setting aside Cutler Park. More done in Cow Island area - with better access?
2. Protection of natural flood plains. Hatch Act reinforced.

OUTLINE OF STATEMENT MADE BEFORE CORPS OF ENGINEERS REGARDING THE UPPER RIVER (SHERBORN TO HOPKINTON)

Banks

1. Largely in natural state and should be kept that way.
2. Except in Milford where river is in open and box culverts.
3. Problems of public access.

Pollution

1. Area is largely unsewered. Unsewered apartment houses and industries near or adjacent to river and tributaries.
2. Inadequate treatment plants - both municipal and state institutions. These put effluent into main river in several places and into tributaries (Mine Brook, Stop River). Inadequacy due to growing population and demands on facilities and to difficulty of getting parts for repairs.
3. Industrial pollution going into Cedar Swamp Pond. Drying lagoons which overflow during rains. Municipal plant cannot handle paint and tile residue.

Recreation

1. Some boating and some swimming (Chicken Brook) now.
2. Fishing could be excellent. But note lack of fish ladders throughout river, except at South Natick.*

Dumping

1. Municipal and state-institution dumping fills banks and pollutes.
2. Informal dumping into river and adjacent wetlands behind garages, stores.
3. General filling of the area's wetlands for building and parking lots.

*Now there is a fish ladder in the new Watertown Dam.

LEAGUE STATEMENT AT WATER QUALITY HEARING, APRIL 1967

Our findings indicate the paradox that the condition of the Charles River has deteriorated over the years while demands for clean water are increasing. Not only does an expanding population increase needs for clean water, but individual needs for clean water are increasing. Four major points should be made:

1. An official classification should be made for the entire river.

2. Chemical determinations, cost figures for pollution abatement projects, and ground water surveys are needed.

3. The old, outmoded and inadequately maintained treatment plants and the burgeoning effluent problems in newer suburbs and older cities have prevented real progress from being made.

4. The Charles River is in large measure an urban river and as such its potential, especially for recreation, is immense.

Pollution Problems

Evidence of downgrading of the river has increased over the last few years. The full use of the river by the people is impaired by pollution and its by-product, odor. Odors from the river, for example, discourage picnicking at the MDC tables opposite the Skating Club on Soldiers Field Road and dining on the restaurant terrace at Newton Upper Falls. Swimming has been abandoned at Magazine Beach since 1952. Fish kills have occured during the summer in Sunset Bay. The public has lost its respect for the river and so incidences of delinquent dumping of old cars and refrigerators can be cited. Towns disregard the purity of the river by allowing dumps to overflow into it, such as in Milford and in Watertown. Industry follows suit, for example, by dumping into Sawin Pond. The ponds, wetlands, tributaries and main river are being polluted increasingly by individuals

municipalities and industry. These pollution problems could be abated or stopped by maintaining specific standards of water quality.

Other causes of pollution need more study. Sewage occurs in the river as a result of overflowing combined sewers, of effluent, and of seepage. (Much has been done by the MDC to abate these.) Urban run-off pollutes. Motor boats add oil and gasoline to the water. And last there is the problem of salinity resulting when small boats make frequent use of the lock at the Charles River Dam.

Methods of Control

Four methods of pollution control mentioned by Mr. Coulter of the Federal Water Pollution Control Administration should be taken into account:

1. Alteration of land use, manufacturing process, and public practices.
2. Collection and treatment of solid waste and sewage.
3. Regulation of waste discharge.
4. Regulation of stream flow.

Regarding land use, regretfully public practice has often been remiss - with dumps of municipalities and of state institutions especially noted. We have been the very few municipal sewage treatment plants in the upper valley already overtaxed by growing population and hindered by inadequate equipment and maintenance. And yet, these communities are to be commended in a situation where so many communities provide no sewage treatment at all.

Recommendations

In order to maintain adequately clean water in the Charles we suggest:

1. Standards should apply to low-flow summer months.

2. Better control of land use, not only adjacent to the river but also in the whole watershed.

3. Low-flow augmentation through impoundment.

4. Better treatment plants and more of them. Also more inter-town cooperation.

5. Better solid waste disposal. Also more inter-town cooperation.

6. Better enforcement.

7. Study of uncombining sewers.

In order fully to utilize recreational opportunities in the Charles Valley, to maintain an adequate water supply, to provide for industrial needs, to serve fish and wildlife activity, and to upgrade environmental value, we recommend:

1. That the river and its tributaries be classified at least B. We realize that color and dissolved oxygen content might seem to force a C classification, but we prefer a conditional B in order to maintain other values.

2. Swimming should be restored in some areas. Water contact resulting from boating and from children playing along the river's banks should be made safe.

3. Where the river is presently A, these areas should remain as such, while still permitting some recreational use.

4. Tributaries should be A.

SELECTED REFERENCES

These publications have been useful to the League of Women Voters in its study of the Charles River:

LEAGUE OF WOMEN VOTERS PUBLICATIONS, FILMS

LAND AND WATER FOR TOMORROW: A HANDBOOK FOR COMMUNITY LEADERS. League of Women Voters Education Fund, 1967.
THE BIG WATER FIGHT, League of Women Voters Education Fund, Stephen Greene Press, Brattleboro, Vermont, 1966.
Clean Water: It's Your Decision, League of Women Voters film with sound.
Current Review of Water Resources. (Kept up to date.)
Population + Production = Pollution, 1965.
Sudbury-Assabet-Concord River Basin Study, Suasco River Basin Group of League of Women Voters, Concord, Mass., 1963.
Water Resources Leader's Guide, 1967. (Contains excellent bibliography.)
Who Pays for Clean Stream?, 1966.

BOOKS

BOSTON: A TOPOGRAPHICAL HISTORY, Walter M. Whitehill, Belknap Press, Cambridge, Mass., 1959.
THE CHARLES (Rivers of America Series), Arthur B. Tourtellot, Rinehart and Co., New York, 1960.
CONTROLLING POLLUTION: THE ECONOMICS OF A CLEANER AMERICA, Marshall I. Goldman, Prentice-Hall, Englewood Cliffs, New Jersey, 1967.
DEATH OF SWEET WATERS, Donald E. Carr, Norton Co., New York, 1966.
DISASTER BY DEFAULT: POLITICS AND WATER POLLUTION, M. Evans & Co., New York, 1966.
DOWNSTREAM: A NATURAL HISTORY OF THE RIVER, John Bardach, Harper & Row, New York, 1964.
ECONOMICS OF REGIONAL WATER QUALITY MANAGEMENT, Allen V. Kneese, Johns Hopkins Press, Baltimore, 1964.
ONE HUNDRED AND ONE QUESTIONS ANSWERED ABOUT WATER RESOURCES, Floyd F. Cunningham, Dodd, Mead, New York, 1967.
THE POLLUTION PARADOX, Jack Gregman and Sergei Lenormand, Spartan Books, Washington, 1966.

GOVERNMENT PAMPHLETS - STUDY OF THE CHARLES

By far the most pertinent and current material on the Charles River is being issued by the participants in the Corps of Engineers Study of the Charles and by the Federal Water Pollution Control Administration in connection with its work in water quality. These are available from any member of the Corps Citizen Advisory Committee (see page 44 for list).

Federal Water Pollution Control Agency:

Biological Aspects of Water Quality: Charles River and Boston Harbor.
Chemical and Physical Aspects of Water Quality: Charles River and Boston Harbor.
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